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SCIENCE NEWS LETTER

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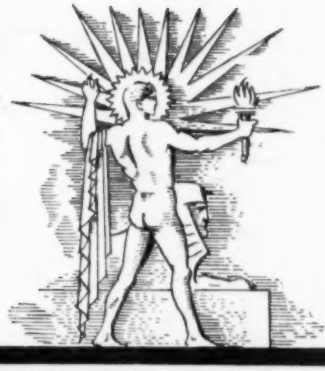
THE WEEKLY SUMMARY OF CURRENT SCIENCE •



October 12, 1940

Germ, 45,000 x Life Size

See Page 230

A SCIENCE SERVICE PUBLICATION

Do You Know?

Apple juice squeezed at the soda fountain is in prospect.

Fire Prevention Week each year includes October 9—the anniversary of Chicago's great fire of 1871.

Seagoing birds that consistently roost on water have been known to accumulate *barnacles* on their bodies, as ships do.

Wolves are probably among the most devoted parents of the animal kingdom, says a writer in Natural History magazine.

Control in France has given Germany rich supplies of *bauxite*, aluminum-bearing clay—important for airplane manufacture.

Experiment stations are seeking *cheaper* ways of feeding silver foxes which will still produce lustrous, dense, and large fur skins.

Many of the London Zoo's fish had to be destroyed when it was realized that a *bomb* might cause the tank reservoirs to flood air-raid shelters.

To eliminate *guesswork* in selecting the proper tool steel for various uses, standards experts plan to classify the 1,000 brands on the market.

Paprika, which is now difficult to obtain from Spain, Yugoslavia, and Hungary, has been grown successfully in test plantings in Louisiana and Florida.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

ANTHROPOLOGY

Why does a scientist believe Chief Powhatan is a composite personality? p. 233.

ASTRONOMY

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Why is it likely to be difficult for American astronomers to view the sun's next eclipse? p. 234.

CHEMISTRY

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MEDICINE

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ORNITHOLOGY

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PHYSICS

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PHYSIOLOGY

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POPULATION

How many Indians will register for military training? p. 236.

PSYCHOLOGY

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PUBLIC HEALTH

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What enemy of all mankind is likely to invade the United States? p. 230.

Why should the Park Service expand its facilities? p. 231.

RADIO

How are schools going to get rid of static in their radio programs? p. 233.

RADIO-MEDICINE

Why is medical treatment with high-frequency apparatus prohibited in Great Britain? p. 233.

A *bird bath* should be partly shaded: birds dislike bathing in water too hot from the sun.

Approximately 42,000 *Indians* in the United States are physically eligible for military service.

Most of the *goat's milk* produced in this country is by persons keeping less than eight goats.

A census of *cottontail* rabbits in three Missouri counties gave estimated returns of 2,777,000 bunnies.

Hittites of 1400 B.C. allowed 144 days for training a *horse* for military use, and the animal was put through a set regime of conditioning.

The United States is now reported to be growing *bulbs* of good quality for producing daffodils, freesias, Dutch iris and certain other flowers.

Records in two states, Connecticut and Ohio, indicate that 90% of men between 25 and 34 years of age have automobile *driving licenses*.

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PHYSICS

Exploring A New World

New Super-Microscope Peers Deeper Than Ever Into Details of Living and Non-Living Things

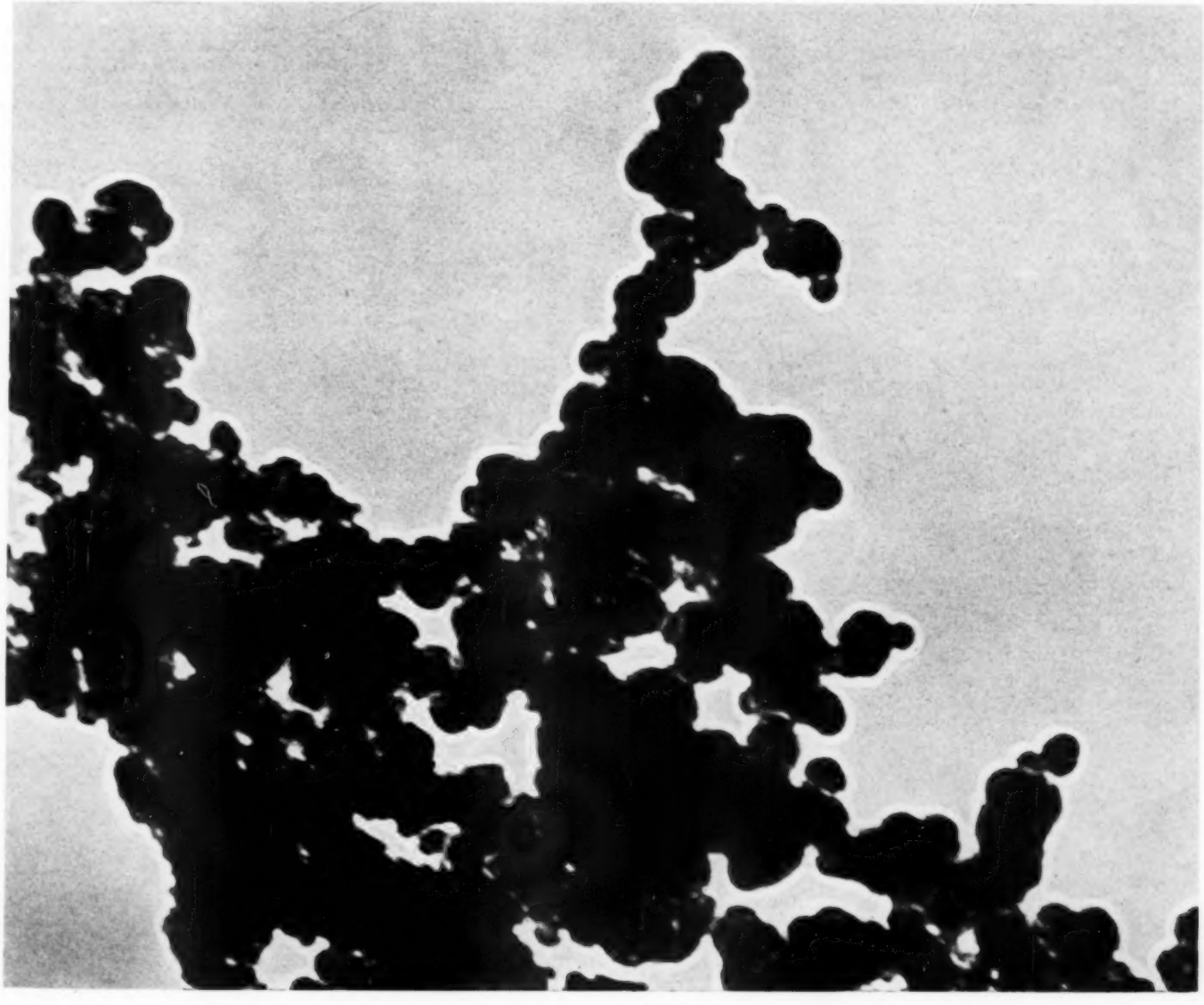
By WATSON DAVIS

MAN'S eyes are being resharpened by a new kind of super-microscope that peers deeper than lenses ever reached before into the way living and non-living things are put together. It uses particles of electricity—electrons—instead of rays of light, and magnetic fields instead of glass lenses, to reveal a world hitherto invisible. Scientists using the new instrument get the thrill that Leeuwenhoek, the Dutch pioneer, felt when he looked through his crude little microscope 250 years ago and was the first man to see the microorganisms that we now commonly call germs.

The familiar microscope of school and laboratory takes us into a world where things are at most 2,000 times larger than life. The microscope which uses ultraviolet light, its rays too short for the eye to perceive, photographs things which are about half as large as the smallest that can be distinguished by the best optical lens microscope; it shows images 5,000 times larger than life. The new apparatus that "sees" by means of electrons attains direct magnifications of 10,000 to 30,000 with such fine detail that photographic enlargements to 100,000 and even 200,000 times life-size are possible. Objects are being seen that are but a fiftieth the size of anything heretofore visible. This means that science is crossing the frontier of a new world.

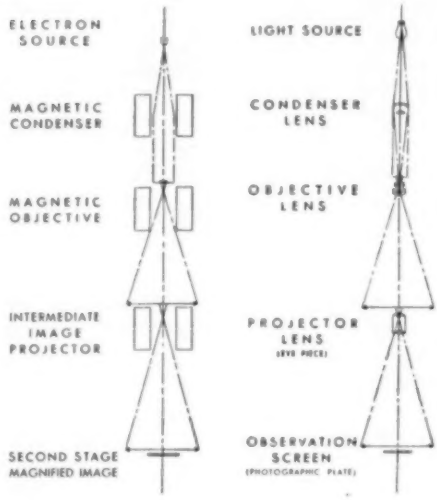
ENLARGED!

Carbon black particles, magnified 113,000 times. They are self-supporting by their own cohesive force and were deposited upon a wire mesh from a sooty flame.



Hesitatingly, hints of what is being seen in this new world are filtering out of the laboratories. Familiar bacteria are sitting for new and more intimate portraits. Disease-causing organisms which up to now have completely avoided the camera are being photographed. The typhoid germ, it is now plainly seen, has wavy flagella sticking out from it. No one knows what they do. The streptococcus germs have rigid and continuous outer membranes that bind them in chains. The germs of whooping cough show a curious internal structure. These bits of knowledge are too new for anyone as yet to put them to practical use. Getting photographs of known murderers for the rogue's gallery, however, is frequently a long step toward sending them to the chair. Just so, the electron microscope holds out hope for further conquest of disease. We need, now, new Pasteurs and Kochs to use the new instrument as those geniuses used the old microscopes.

And, of course, industry is intensely interested. There is a continuous procession of men from industrial laboratories

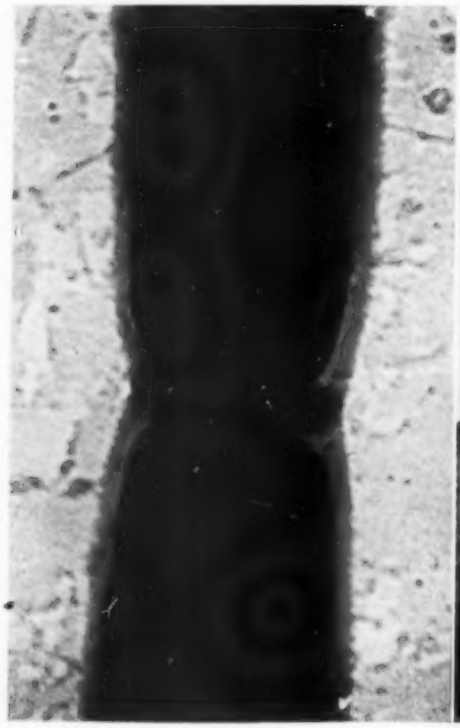


to Camden, N. J. where the Radio Corporation of America is developing the most advanced American electron microscope. The visitors slide specimens of their products into the instrument and depart excitedly whispering among themselves about their new vision of the real structure of, let us say, a synthetic textile fiber. Naturally, they give no hint as yet of where new knowledge may lead them. But a suggestion of the way business may use the new tool seeps out of Germany. There, the manufacture of cement already has been improved, and there is hope that the study of mine dusts under way may give a clue toward solving the problem of mine sanitation.

Under the electron microscope, the iron oxide powder called rouge, which is the finest polishing material used industrially, is shown when magnified 15,000 diameters to consist of jagged masses. The carbon particles in a gas flame and the crystals in the smoke of a cigar are shown to have distinctive shapes, easily identified. Particles of colloidal gold and silver are seen plainly. Physicists, chemists and bacteriologists have built all of their past achievements on the foundation of the exact knowledge yielded by instruments, and every new instrument has brought new advances. The electron microscope will have the same effect.

KILLER

Anthrax bacilli, magnified 45,000 times. This view is interesting to scientists because of the structure between the ends of the portions of the two bacilli shown. They also want to know the meaning of the plate-like structures in the background.



SMALLEST VISIBLE

Molecules themselves may be seen in this electron micrograph, magnification 105,000 times. Scientists guess that the smallest particles visible are really molecules. This is a thin filament of a plasticized polymer of vinylchloride containing about 2% carbon black, a synthetic rubber-like substance manufactured by Goodrich.

NEW INSTRUMENT

Dr. V. K. Zworykin, standing, head of the RCA Electronic Research Laboratory, under whose supervision James Hillier (at the controls) and a group of associates developed the new RCA electron microscope. The microscope magnifies bacteria and other minute objects from 20 to 50 times as much as is possible with the finest optical microscope. The new instrument shown here incorporates radical improvements in design over an earlier one announced in April (see SNL, May 4). Its size and cost have been reduced by almost half to place it within reach of more laboratories, schools and research workers.

It is not an impressive looking thing—not nearly as impressive as the great 200-inch telescope, though it may well prove to be more important in extending man's knowledge of his universe. The first super-microscope built in Camden was enormous. The newest, stream-lined model is a pillar about six and a half feet tall. It sits on a desk. There are knobs and dials; that's all you see. But inside, there is a hairpin filament of tungsten at the top of the column. When current flows through this filament, it emits streams of electrons. A fundamental principle of electronic radiation is that the beams are affected by magnetic force. Just below the filament is a difference of voltage which accelerates the downward speed of the electron streams. Further along are magnetic fields which deflect the rays—change their direction of travel. The object is to bring the electrons to a focus. In other words, the magnetic fields act on the electron radiation precisely as glass lenses act on light rays.

The interior of the column has to be airless so that the electron streams may flow freely, and one of the tricks in making the apparatus has been to devise an air lock so that specimens can be placed in the microscope without destroying this high vacuum. Specimens to be viewed are put on very thin but tough films, often cellulose nitrate. One disadvantage is that electron beams are deadly to living things; the electron microscope gives a still, killed image contrasted with the moving, living picture of an ordinary microscope.

Seen on Fluorescent Screen

When electrons beat upon layers of certain chemicals, the chemicals fluoresce, that is, they give off light. A fluorescent screen placed at the point of focus allows the human eye to see in great detail the shadow cast by the specimen in the path of the electronic beam. Replace the screen with a photographic plate and you get a permanent image, to be examined at leisure. This is not "photography", by the way, for no "photons", no light "particles", are used. So meticulous scientists have coined the phrase "electron micrographs".

Two great electrical companies are leading in the development of the new instrument, Siemens & Halske A.G. in Germany and RCA. The Germans, especially Dr. E. Ruska, got started first on the "übermikroskop." Anything in the domain of the electron is in the province of RCA—radio, television, the "electric eye", the new phonograph—and the corporation promptly started its own research to catch up with the Germans. A group of specialists joined RCA's Dr. V. K. Zworykin in developing the microscope. Dr. Ladislaus Marton came from the University of Brussels, young James Hillier from the University of Toronto, while Arthur W. Vance developed the intricate electrical circuits necessary.

The first instrument they turned out was as big as the side of a house. The latest model can be carried through any laboratory door, and it retails for a modest $9,500. Obvious customers are the medical, physical and chemical laboratories of the great research foundations, the universities and industries.

The scientific genealogy of the electron microscope starts with the discovery of the electron itself by J. J. Thomson before the turn of the century—the Thomson who was to become famous and knighted and remain active until his death this year. In the course of the revolution in physics that arose out of the work of Einstein and Heisenberg, de Broglie, the Frenchman, predicted from theory that electrons were waves. Davisson and Germer, of Bell Telephone Laboratories, and G. P. Thomson, in England, son of J. J., independently demonstrated that de Broglie was right and that electrons act like light. In 1926, H. Busch and others introduced the idea of electron lenses. This established the field of electron optics which is the basis of the present-day electron microscope. What is believed to be the first electron picture ever made was a crude thing—the shadow of a dollar bill laid upon a photographic plate under an intense beam of cathode rays from a tube, which could be done even if electrons did not act like light. That was fifteen years ago.

It is a deep dive from the picture of a dollar bill to photographs of the viruses, those living organisms or mere chemical

IT CLINGS

Face powder, one minute grain enlarged 25,000 times. It is a kind that clings to the face, probably because it is so . ough.

molecules, according to which scientist is talking at the moment. Whatever they are, they cause influenza, the common cold, smallpox, infantile paralysis and, who knows, perhaps cancer. We are about to have our first look at them—new pictures to enlarge the rogue's gallery of medicine.

We also are about to photograph the vitamins and the enzymes, which like the viruses are too small in structure for any previous instrument to catch. There will be hundreds of surprises in the common substances around us and within us when there are a sufficient number of electron microscopes put to work.

Even Molecules of Matter

But the possibility which gets the scientists most excited is that they may even see the molecules of matter. Though micrographs of the molecule are just now a little beyond the horizon of the instrument, there is no theoretical reason why they may not be achieved; the super-microscope will only have to reach particles one hundredth the size of those it now easily photographs. Lifetimes of labor and millions of dollars are being spent on chemical methods of getting circumstantial evidence of molecular design. Direct molecular micrography would be a great fundamental achievement. It might even surpass in its consequences the roles that electrons play in telephone and radio. Chemists have been like clever blind men, using their brains instead of eyes to puzzle out the structure of the molecule. If they could really see how molecules of various substances are put together, it might—almost certainly would—speed up enormously the advance of organic chemistry, the science which already has given us nylon, rayon, synthetic rubber, the plastics—whole new industries.

To understand how it may be possible to reach down into the infinitesimal and actually study the arrangement of the atoms in the molecule, we shall have to know the dimensions involved in the problem. The convenient scale is the Angstrom, used in measuring light waves. (The name honors a Swedish physicist.) An ordinary pencil lead is about a millimeter in diameter. A millimeter is 10,000,000 Angstroms. Like Alice in Wonderland, nibble your imaginative mushroom on the side labeled "Going Down" and note the various stops as we descend. Starting at a millimeter—10,000,000 Angstroms—we come to the reddest light we can distinguish with the eye, in other words, the longest wave-length of visible light, at 7600 Angstroms, and we pass the shortest visible light, deep violet, at 3900 Angstroms. How small a thing we can see depends upon the wave-length of the light we use to do the seeing, much as the size of human fingers sets a limit to how tiny an object we can pick up. With visible light, that is, in the ordinary microscope, we can pick up objects about 2000 Angstroms in diameter, about half the wave-length of the shortest visible light ray. The ultraviolet ray microscope, using wave-lengths about half as long as the shortest we can see, can pick up objects about 800 Angstroms in diameter.

The wave-length of electronic radiation varies according to how fast the electrons are traveling. An electron pushed along by a potential of only one volt travels nearly 370 miles per second, which is slow going in the electronic world, but gives a wave-length of 12 Angstroms. A million-volt potential pushes electrons whizzing at more than 175,000 miles per second, giving a wave-length of about one-hundredth of an Angstrom. Atoms are about 2 Angstroms apart in a molecule consisting of carbon and hydrogen atoms, to choose one example. That is why scientists believe it probable molecules may be photographed.

The electron microscopes in use up to now have a range of 10,000 to 90,000 volts. The smallest sizes of particles now being seen with the instrument are about 100 down to 50 Angstroms. The one thing in the universe the electron microscope never will be able to "see" is the electron itself, smallest particle or least gob of electricity, or most minute atomic fragment, whichever you may wish to call it.

This suggests the horizon toward which scientists in London, Berlin, Camden, Toronto and Pasadena are pushing. The hard exciting trail toward the infinitely small beckons. A new era of exploration has begun.

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PHYSICS

"Whiskers" Made Visible On Micro-organisms

See Front Cover

THE micro-organism on the cover is 45,000 times life-size. It was photographed with the new electron microscope in the RCA laboratories at Camden. It is Aerobacter cloacae found in the intestines. Note that the electron microscope shows flagella extending from the organism. There is what appears to be a capsule about the organism. Preparation by Dr. K. Polevitsky of the University of Pennsylvania Dental School.

Science News Letter, October 12, 1940

PUBLIC HEALTH

Warns U. S. Is in Danger Of Invasion by Epidemics

AMERICA is in greater immediate danger of an invasion of her shores by epidemics almost sure to sweep Europe this winter, than by any armed forces. This was the gist of a statement by the chairman of the Medical Preparedness Committee for the State of Michigan, Dr. Burton R. Corbus. He said that American medicine is rallying to meet this threat.

Dr. Corbus pointed out that typhus in the Balkans and France is very prevalent, and "it is expected that influenza will hit these regions and others this year. Almost surely the epidemics will leak to these shores."

He said that another problem to be met by American medicine, in the unfortunate eventuality of war, was the impossibility of avoiding dealing with tropical diseases unfamiliar to many doctors taken from civil practice. If our troops had to move southward, "some additional instruction in these subjects would have to be given physicians attached to troop units," he said.

"Remember what havoc yellow fever caused among the men working on the Panama Canal," Dr. Corbus emphasized, "and yellow fever, together with malaria, is one of the more familiar tropical diseases."

He stressed the well-known fact that this country's supply of quinine is not adequate to meet the demands which such conditions would place upon it, pointing out that the substitute for this drug has not been thoroughly proven.

Dr. Corbus served during the first world war as a major in the medical department, attached to an evacuation hospital.

Science News Letter, October 12, 1940

ASTRONOMY

Fourth Comet of the Year Is Found By Harvard Man

Patrol Plate Exposed on August 8 Reveals Comet Of Tenth Magnitude in Constellation of Aquila

By DR. HARLOW SHAPLEY
Director, Harvard College Observatory

THE FOURTH comet of 1940 was recently discovered by Dr. Fred L. Whipple on a Harvard Observatory patrol plate exposed on August 8. At that time the comet was about the tenth magnitude, in the constellation of Aquila. It was moving rapidly south in the sky at a rate of nearly 2 degrees per day. Images of the comet were found on 16 Harvard plates taken from July 28 to August 10. During the following full-moon period the comet passed into the southern sky out of range of northern observers.

An orbit calculated by Dr. Whipple shows that it is inclined 55 degrees to the plane of the ecliptic and that the comet passed nearest to the sun on October 7, at a distance just greater than one astronomical unit, about 101,000,000 miles.

At the present time the comet is about 12 degrees from the south celestial pole. It will remain in the southern sky at about its discovery brightness for the rest of this year. As it moves north early in 1941 it will probably be too far away and faint for observation from American or European observatories. The period of the comet's revolution about the sun is probably quite long.

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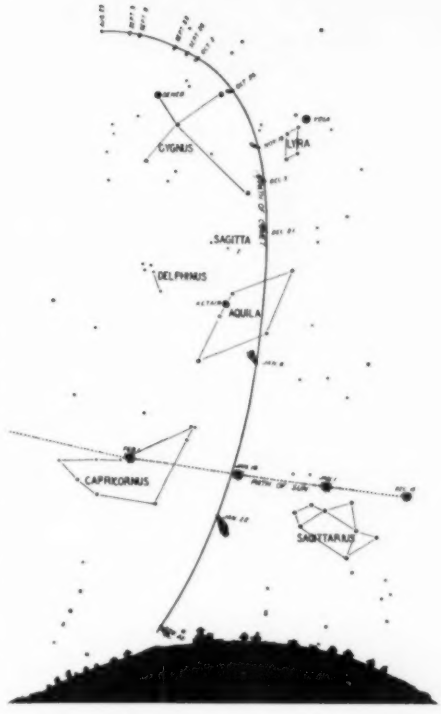

CUNNINGHAM'S COMET NEARS

Though Whipple's comet, described in the accompanying article by Dr. Shapley, will not reach naked eye visibility, the one found a few weeks earlier by Leland S. Cunningham, also of the Harvard College Observatory is expected to do so. (See SNL, Sept. 28) By November it should be visible with field glasses, and soon after Christmas apparent to the naked eye as a tailed object in the western sky after sun set. This diagram, prepared by The Franklin Institute, shows its path, as predicted by Mr. Cunningham.

PUBLIC HEALTH

Fitness for National Defense Stressed By Recreation Experts

Athletic Areas and Playgrounds Should Be Kept Open All Day To Build Health, Patriotism and Morale

ADVOCATING strenuous physical conditioning, not only for young men assigned to defense training camps, but for young Americans everywhere, Prof. C. L. Brownell of Teachers College outlined a six-point universal athletic program for these times. Prof. Brownell presented the outline before the National Recreation Congress.

His six points were:

(1) There will be no total defense until there is an adequate recreation program with emphasis on athletics.

(2) In each community there is needed a coordinating agency responsible for utilizing, popularizing, and elaborating the athletic programs now being conducted by all official, non-official and private organizations.

(3) All athletic areas, such as playgrounds, recreation centers, and athletic fields should be kept open from early morning until late at night.

(4) In congested areas emergency play centers should be established at once in parks and streets.

(5) Programs of instruction should be established and streamlined to provide adequately trained athletic leaders.

(6) The program of athletics should stress activities which result in physical fitness, the desire to cooperate with others, and national morale as a means of instilling personal and civic patriotism for peace as well as for war.

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Should Expand Park Works

THAT the United States should expand, not reduce, its park and recreation programs as a national defense measure is the advice repeatedly stressed at the National Recreation Congress.

Already there have been a few recommendations to abolish or cut the interpretive work of naturalists in some of the national parks, Carl P. Russell of the National Park Service has warned.

Speaking from Canada's war experience, A. T. Whitaker, Commissioner of the Canadian Niagara Parks, declared that even the military cannot make men out of weaklings save at high cost, and it is far more economical to build up physically the young generation by providing outdoor interests and exercises.

"The long-range view should result in greater, not less, provision for parks and recreation," he stated, "if democracy is to stand up against the war machines of totalitarian states with their military development of youth from the most tender ages."

Stressing the importance of raising "a strong generation of sons and daughters to defend our democracy," F. A. Pitkin, executive director of the Pennsylvania State Planning Board, urged a large increase in parks and forests within easy reach of city people.

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CHEMISTRY

New Electric Lamp Uses Tellurium, Common Element

TELLURIUM, an element related to sulfur, discovered about a century and a half ago, and, though not rare, has so far found very few applications, is used in a new electric lamp. To its inventors, John W. Marden, East Orange, N. J., Norman C. Beese, Verona, N. J., and George Meister, Newark, N. J., the U. S. Patent Office has just granted U. S. Patent 2,215,648. Rights have been assigned to the Westinghouse Electric and Manufacturing Company. The inventors are connected with the Westinghouse Lamp Works, at Bloomfield, N. J.

Actual light comes from a glass tube shaped like an inverted J, contained in a larger bulb. The tube contains tellurium vapor. With a tube four inches long and a little more than a half inch in diameter, satisfactory operation was secured with two to three amperes of electrical current at 150 to 200 volts.

A curious characteristic of the tellurium light is that it resembles that of a glowing solid more than of a glowing gas. The latter usually, when broken into a spectrum, shows a series of bright lines, but that from tellurium vapor shows more of a continuous spectrum. When operated at the correct voltage, its light is very close to daylight, so perhaps the lamp will have applications where artificial daylight is needed.

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PSYCHOLOGY

Hitler Uses Psychology To Influence His People

THE SECRET of Hitler's success is to be found in the researches of a great Russian psychologist — Pavlov. So declares a follower of Pavlov, Serge Chakotin in a new book, *The Rape of the Masses* (Alliance Book Corporation).

The secret is in the ability of the human mind to form "conditioned reflexes." Not necessarily that Hitler himself could describe what is meant by this psychological term. But, uneducated though he may be, he has hit upon a way to exploit the knowledge that was made available to psychologists by the great Pavlov.

Pavlov discovered that a dog, whose mouth naturally waters while he eats his food, could be "conditioned" to mouth-watering at the sound of a dinner bell after the bell had been repeatedly sounded while the dog ate.

Hitler, Mr. Chakotin points out, has discovered that the German people can be similarly conditioned to respond in certain ways to the sound of the words "Heil Hitler" or the many other symbols of the Nazi regime.

Hitler, he says, makes use of suggestion on the basis of the combative instinct.

"This suggestion works by actual menace from time to time, as an absolute factor, and in the interim by the mass dissemination of symbols which recall the menace and thus act as a conditional factor."

Thus the constant parade of uniforms, flags, the display everywhere of the swastika continuously act to rouse the fear, the enthusiasm, the excitement of the German people just as would the presence of Hitler himself.

Because the symbols of Hitler are seen and heard universally in Germany and in Nazi-dominated territory, Hitler is able to have the same effect on the people as though he were himself omnipresent and omniscient.

Science News Letter, October 12, 1940

MEDICINE

House Flies Indicted as Carriers of Cow Disease

COMMON house flies, together with a less familiar insect known as frit flies or eye gnats, have been indicted as carriers of bovine mastitis, a troublesome and loss-causing bacterial disease that attack cows' udders. In *Science* (Sept. 27), Dr. D. A. Sanders of the University of Florida sets forth observations which have led him to this conclusion.

He watched both kinds of insects closely, and observed that they habitually fed on waste milk and on stable filth, and flew from these sources to the milk openings. The eye gnats also hung around the animals' eyes, and other body openings.

Dr. Sanders also permitted insects of the suspected species to gain access to the udders of uninfected cows. The animals subsequently developed mastitis, which afforded strong supporting evidence in favor of his conclusions.

Transmitting mastitis does not seem to be the limit of the eye gnats' mischief-making. Calling attention to previous convictions of these insects on the score of carrying conjunctivitis and yaws among human beings, Dr. Sanders suggests that they may also carry the germs of brucellosis or contagious abortion among cattle.

Science News Letter, October 12, 1940

IN SCIEN

MEDICINE

London Appeals to U. S. For Instruments, Supplies

SURGEONS and first aid stations treating air raid victims in London are in urgent need of surgical instruments and supplies, for lack of which many lives may be lost, it has just been learned.

A list of 69 separate kinds of instruments and supplies, sent by clipper "from a source of highest authority in London" to the Duchess of Leinster now in this country, appears in the *Journal of the American Medical Association* (Oct. 5) with an appeal to American doctors to contribute their surplus instruments to help save lives that might otherwise be lost.

Injuries to head, chest and bones are most numerous, if one can judge from the type of instruments and supplies requested.

Science News Letter, October 12, 1940

MEDICINE

Bible Describes Symptoms Due To Vitamin Deficiency

VITAMINS were unknown in biblical times, but the ailments now attributed to vitamin lack were observed, Dr. Walter J. Peterson, of Kansas State College, told the American Chemical Society.

He quoted a passage in which Jeremiah, writing of wild asses, says "their eyes did fail, because there was no grass."

"Today," Dr. Peterson commented, "we of course know that grass and all green growing plants contain a yellow pigment, carotene, the precursor of vitamin A, which when absent from the ration of all animals produces as one of its most specific symptoms, xerophthalmia, or blindness."

Recently developed tests for the vitamin A potency of a feed enable the poultry- and cattleman to obtain quickly and easily carotene assay of the feed he is to buy. This is valuable because a high carotene value normally indicates a high content of other important vitamins, Dr. Peterson pointed out.

Science News Letter, October 12, 1940

NE FIELDS

RADIO—MEDICINE

High-Frequency Apparatus Prohibited in England

USE or possession of high-frequency apparatus, such as used for medical treatment, has been prohibited in Great Britain as a war measure, information reaching here states. There is danger of interference at a vital moment to the radio communications of airplanes and other military services. It is explained that the user of high-frequency apparatus is nearly always unaware of the interference it is causing and that it is very difficult to locate the source of the interference.

Permits allowing high-frequency apparatus to be operated under some circumstances may be issued to hospitals and clinics, manufacturing establishments needing high-frequency apparatus and research laboratories.

Science News Letter, October 12, 1940

ANTHROPOLOGY

Pocahontas' Pa Probably Just One of Powhatans

THAT formidable deeds of Pocahontas' famous father, Chief Powhatan, and those of other chiefs with the same nickname may have been blended into a composite Indian in American history is the revelation of David I. Bushnell, Jr., Smithsonian Institution ethnologist.

Powhatan, he explains, is simply a descriptive place name, meaning "falls in a current." Pocahontas' father, whose right name was Wahunsonocock, had his favorite residence at a village called Powhatan—on the James River where Richmond now stands. The name Powhatan came to be applied to the man himself.

That there may have been several Powhatans in Virginia, Mr. Bushnell suspects, since the name would fit almost any village by a waterfall, and might also be applied to its leading citizen. The name was widely prominent, because even a confederacy of Algonquin tribes that Chief Powhatan—father of Pocahontas—led was known by this name Powhatan.

Archaeological and language studies can clear up, to some extent, some of the mysteries regarding early English settlements at Jamestown, Va., and Roanoke Island, in North Carolina, it is hoped. The famous "lost colony" of Roanoke Island, was actually two "lost colonies," and Mr. Bushnell has been studying the confusing records that have survived for clues to the tangle. One of these lost colonies, it is not yet clear which one, had four members who survived the slaughter of "Powhatan of Roanoke," and who found shelter with friendly Indians. Indians who thus defied the Powhatans are believed to have been Sioux, for Mr. Bushnell points out that Sioux Indians were at war constantly with Algonquins. Descendants of the four white survivors may have been among Sioux Indians who later migrated to the West.

Science News Letter, October 12, 1940

PHYSIOLOGY

U. S. Scientists Explore Food Values of Seaweeds

SEAWEED is produced in immense quantities along all the world's seacoasts, yet very little of it gets used directly as human food. The Japanese make use of a jelly-like seaweed product known as agar, and in Europe a certain amount of a crisp and curly sea-plant known as Irish moss is eaten. That is about all.

In an effort to arrive at an estimate of the food values of these seaweed products, Dr. Hugo W. Nilson and J. W. Schaller of the U. S. Fish and Wildlife Laboratory at College Park, Md., added graded percentages of both agar and Irish moss to the rations of young rats, weighing the animals to keep track of weight gains. They also made examinations to learn how much of the total seaweed fed was actually digested by the animals.

The rats throve on most of the diets, though they did not gain weight any faster than control groups of animals fed on standard rations. The only notable exception was the group on a diet containing 10% agar; these gained 20% more weight than the controls. Rats receiving 20% Irish moss did badly: half of them died, and the survivors gained only about two-thirds as much weight as was gained by the control animals.

Both kinds of seaweed products absorb great quantities of water, so that the rats fed on them were very thirsty. They drank nearly twice as much water for every gram of weight gained, when 30% agar and 20% Irish moss were fed to them.

Science News Letter, October 12, 1940

RADIO

FM Radio Now Used in Public School Broadcasts

WITH modern school systems using radio to carry instruction to classes throughout a city there was always a hope for little Johnny or Mary that static, natural or man-made, might interfere with the program, and they would be excused from a class. But this excuse is eliminated now with the use of static-free FM (frequency modulated) radio for educational broadcasts.

The Federal Communications Commission has granted permission for FM stations to the Boards of Education both in San Francisco and Cleveland. The former is to be a new station, operating on 42,100 kilocycles, unlimited time, with one kilowatt of power. Thirteen studios will be connected by leased wires to the station.

For some time the Cleveland Board of Education has been operating station WBOE, on amplitude modulation, with 500 watts power. This will change to FM, on 42,500 kilocycles with 1000 watts power, both day and night.

Science News Letter, October 12, 1940

CHEMISTRY

Air Space in Bottle Neck Found Bad for the Wine

WINE bottles should not have so much air space left in their necks; they should be filled up closer to the cork. This laudable practise was recommended to the American Chemical Society by a four-man research team, as the prime means for preventing bottled wine from spoiling.

The oxygen in this space (known as "headspace" to vintners) goes into combination with certain compounds in the wine, causing darker color, cloudiness, dregginess and off flavor, the report stated. Filling the bottles with hot wine, leaving little headspace, and corking while hot will do much to eliminate wine-spoiling air.

Next to leaving too much air in the bottle, worst spoilage causes are keeping wine in bright sunlight and at too high a room temperature. Both kinds of exposure are common in American liquor stores, as contrasted with the cool, dark cellars where Europeans traditionally keep their wine.

The research on wine spoilage was conducted by C. A. Pederson of the New York Agricultural Experiment Station at Geneva, and Dr. H. E. Goresline, A. L. Curl and E. A. Beavens of the U. S. Department of Agriculture.

Science News Letter, October 12, 1940

ASTRONOMY

Clouds Prevent the Viewing Of Sun's Total Eclipse

Expeditions From United States With Elaborate Equipment Disappointed Despite Favorable Forecast

EVEN though they chose a location in a very dry as well as high region of South America, where the chances for good weather seemed extremely favorable, cloudy weather spoiled the astronomical observations of the two expeditions from the United States to observe the total eclipse of the sun October 1. One of these was sponsored jointly by the National Bureau of Standards and the National Geographic Society; the other was from Brown University.

A report received from Dr. Irvine C. Gardner, leader of the former party, said that the eclipse itself was eclipsed by the clouds. Thus, the elaborate equipment, weighing about seven and a half tons, which they transported from Washington, was largely useless. No opportunity was given to try the control device, operated like an electric player piano, which had been arranged to operate the various cameras automatically, and give the astronomers the opportunity to watch the events in the sky.

This expedition, however, was better off than many others in the past, for which cloudy weather has meant complete failure to secure useful results. One of the main items on the program was a study of the way that the transmission of radio waves through the upper layers of the atmosphere is changed as the moon's shadow goes by. This is unaffected by clouds, and these observations were made satisfactorily, Dr. Gardner reported. The actual results will not be known until after careful study of the data.

Dr. Charles H. Smiley, of Brown University, had journeyed about 50 miles farther inland, to the town of Curema, but there were clouds there, too.

Dr. Smiley had planned to take photographs at Curema with a special type of star camera, known as a Schwarzschild telescope. With this he hoped to record the zodiacal light, a faint glow sometimes seen near the sun. Accompanying him was Dr. Alice Farnsworth, of Mt. Holyoke College, who was to use other equipment, including a spectroscopic camera, for further observations. Dr. Smiley's report, which was delayed because of the remoteness of Curema, said that all the films were exposed, though he is certain they will be of little value.

Science News Letter, October 12, 1940

Photography Incidental

NO WORD has yet been received by the Cruft Laboratory of Harvard University concerning the exedition to Queenstown, South Africa, to make radio observations in connection with the eclipse.

The party, under the direction of Dr. J. A. Pierce, is now carrying out a three-months' program to study the effect of the eclipse on radio transmission before, during, and after the time the moon passed in front of the sun. Since this is unaffected by clouds, it is assumed that the observations were carried out as planned.

A motion picture of the eclipse was planned incidentally, mainly to give a record of the extent to which the moon covered the sun, for checking with the radio data. If this was taken, it may have considerable value, as one of the few photographic records made of this eclipse.

There are, however, several large observatories in South Africa. It is quite likely that some members of their staffs made an effort to observe the eclipse, for it is hard to imagine an astronomer neglecting one so near home. On account of the war, it may be some time before news of any such results reaches the United States.

Science News Letter, October 12, 1940

Next Seen from China

ASTRONOMERS are turning to their reference works to see when they will have another chance. This will come on Sept. 21, 1941, though plans are very uncertain, because the best place from which to see it will be the coast of China, between Foochow and Wenchow, as well as farther inland, at Hankow and Nanchang. Whether foreign astronomers, especially Americans, will be able to set up their instruments there by next September is perhaps rather questionable.

The tip of the moon's shadow, on that date, will first touch earth at sunrise in Russia near Astrakhan. Then it will cross the Caspian Sea, the Aral Sea, Turkestan, Tibet and China. After that it will pass across the western Pacific Ocean, including the American island of Guam. Here the sun will be blacked out for about two and one-half minutes, or fifty seconds less than in China, but this would still give time for many valuable observations.

Science News Letter, October 12, 1940

BIOLOGY

Barro Colorado Island Now a Government Center

SCIENTISTS of both Americas have a new common center for research, on the tropical laboratory island of Barro Colorado in the great artificial Lake Gatun, Panama Canal Zone. This island, which has hitherto been administered by a non-government board under the auspices of the National Research Council, has now become a government research area by recent act of Congress, and the first meeting of its board of directors has just been held at the headquarters of the National Academy of Sciences.

The official board of trustees consists of the Secretaries of War, Agriculture and Interior, the Secretary of the Smithsonian Institution, the President of the National Academy of Sciences, and three eminent biologists. The three biologists on the present board are Dr. Thomas Barbour, director of the Harvard Museum of Comparative Zoology, Dr. Elmer D. Merrill, director of the Arnold Arboretum, and Dr. Alexander Wetmore, assistant secretary of the Smithsonian Institution. Future meetings of the board will be held on the day after the spring meeting of the National Academy of Sciences in Washington.

Barro Colorado Island was once a hill rising out of a valley in the Panama Canal region. When the waters backed up behind Gatun Dam it was cut off and became an island, harboring a most interesting sample of tropical American plant and animal life. Interested scientists mainly from the United States, arranged for the establishment of a research center there, which constitutes the beginnings of what is expected to become, under the newly established government auspices, one of the most important natural laboratories in the world.

Science News Letter, October 12, 1940

Foot arch supports made of *plastic* are new.

EARTH-BOUND

This is the Kiwi, famous in cross-word puzzles, and because of the officers in the World War air services who were so called because they did not fly.

ORNITHOLOGY

Kiwi, Bird That Supplies Aviation Nickname, Shown

KIWIS, wingless birds whose name is tossed as an epithet by aviators at the non-flying ground officers of their service, are now represented in a new exhibit at the Field Museum of Natural History. The group shows a kiwi standing guard over two disproportionately large eggs in its nest under a cycad bush.

The kiwi, a native of New Zealand, is one of the strangest-looking birds now living. Its wings have degenerated to mere internal nubbins of bone, its body is covered with long, fringy feathers that look almost like hair, and it has a long bill which it uses in probing for worms and in tapping, like a blind man, to guide it on its weak-sighted way.

It is about the size of a hen, but its eggs are ten times the size of hens' eggs. They weigh one-fourth as much as the bird that lays them.

In the kiwi family, it is the female bird that rules the roost. The male, a good third smaller than his mate, meekly sits on the eggs and broods the chicks. The hen takes over the defense of the nest if an intruder threatens. She kicks straight forward, like an ostrich, with her unfemininely large and strong feet, and since her toenails are hard and sharp she can inflict really nasty wounds.

Science News Letter, October 12, 1940

Prematurity causes one-half of the deaths among new babies.

PHYSICS

Chemical Treatment of Glass Makes It More Transparent

Photographic Lenses May be Speeded by Dissolving, With Nitric Acid, Oxides From Thin Layer of Glass

CHEMICAL treatment of glass surfaces can make them more transparent, members of the Optical Society of America were told at their meeting in Rochester. Frank L. Jones and Howard J. Homer reported on their researches at the Mellon Institute, Pittsburgh, which may have many important applications. Photographic lenses may be made faster in their operation, for example, or telescopes used at night by ship lookouts on the watch for enemy submarines will gather more light and show a clearer view.

Previously methods have been used for increasing the amount of light passing through lenses, thus decreasing the amount that they reflect, by applying thin films of another material. The method studied by Mr. Jones and Mr. Homer, however, treats the surface of the glass to form a film, by dissolving away the oxides from a thin layer.

"Such removal is possible without damage to the surface polish if the solvent does not dissolve silica," they reported. One of the best solvents, they found, was a weak acid solution, such as one per cent nitric acid, though solutions of salts, alkaline phosphates, melted salts and even water were found to show the effect.

Apparently it will hardly be safe for amateur photographers to attempt treating their own lenses without expert advice, for they found that glass surfaces not freshly prepared reacted in an uneven fashion. After the surface film is once formed, they said, "it can be processed in various ways that will render the surface unreactive, so that a second treatment will not appreciably change the thickness of the film."

Science News Letter, October 12, 1940

Lenses Change With Cold

AS AN AID to accurate aerial photography optical scientists were urged to obtain data showing the performance of lenses at very low temperatures by A. Francis Turner, of the Bausch and Lomb Optical Company. He said that a lens changes in focus by a fraction of one per cent with a change in temperature of 50 degrees centigrade, that is, of half the range from the freezing to the boiling point.

"Although such temperature effects are small," he stated, "they cannot always be ignored in the design of optical instruments, as for use in airplanes, where 40 degrees below zero centigrade (which happens also to be 40 degrees below zero in the Fahrenheit scale) may be encountered. A need is felt by the industry for more low temperature data on optical glasses."

Science News Letter, October 12, 1940

Brightness of Lamp Varies

IN MANY kinds of scientific work, a very constant source of light is needed, but with an electric lamp, variations in the current supplied to it may cause considerable changes in the light intensity.

Harold Stewart, of the University of Rochester, told the Optical Society meeting that he had used a special regulator. The voltage of the incoming electricity varied by several per cent, but the regulator cut it down to about 1/400 of one per cent. Even then, he said, the output of light varied more than 1/10 of a per cent, due to causes within the lamp itself.

By arranging an electric eye to watch the lamp and, in turn, control the electron tubes in the voltage regulator, he was able to secure light of more constant intensity.

Science News Letter, October 12, 1940

LANGUAGES Made *easy* By LINGUAPHONE

This amazing new Method enables you, *in your own home*, to speak and read any of 27 foreign languages in an incredibly short time. Endorsed by leading university professors and thousands of men and women as the quickest, simplest and most thorough language method. Send for FREE book.

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SCIENCE SERVICE AT THE FAIR

During the past summer Science Service has cooperated with the Hall of Inventions, New York World's Fair in providing exhibits and news about recent inventions. The display pictured above, of the blood transfusion device invented by Dr. Haldane Gee (S.N.L., Aug. 31, 1940, p. 142), attracted an unusual amount of attention.

POPULATION

To Register 40,000 Indians And Eskimos for Draft

Navajos, Apaches and Other Tribesmen, Many of Them Sons of World War Veterans, Will Register Wednesday

ABOUT 40,000 young Navajos, Apaches and other Indians—many of them sons of World War veterans—will present themselves when 16,400,000 Americans register for peacetime training for national defense. The number includes 3,500 Eskimos and Indians in Alaska.

To Commissioner John Collier of the Office of Indian Affairs falls the task of registering Indians on most of the reservations, just as governors of states register general population.

Indian Service officials praise highly the military qualities of America's Indians, tested under modern fighting conditions during the World War.

Traits that served Black Hawk and less famous old-time Indians on the warpath prove just as valuable in mechanized warfare. Conspicuous among Indian fighting traits are remembering and carrying out orders, displaying fortitude and endurance, and willingness to volunteer for hazardous feats.

Indians in the A.E.F. won special praise for unique service in scouting and signaling, in which sign language and Indian tongues played a valued role.

One story, widely told, concerns two Choctaw Indians dispatched to the rescue when a section of the American trenches in France was getting heavy gunfire from German batteries. The trouble was that telephone wires in the neighborhood were being tapped so successfully by German language and code experts that all signals became German property. But up came the Indians, one to an outpost and one to the American battery, and from then on American signals were relayed in Choctaw, which the German intelligence staff had not mastered.

While some Indians were drafted into the United States army during the World War, a large proportion of the 17,000 who served were volunteers. In that emergency, only part of the United States Indian population was subject to draft, but in 1924 an act of Congress made all Indians citizens. All Indian men within the 21-to-35 year age limits now have citizens' responsibilities for defending the nation.

The Indian Service explains that, besides registering Indians on the reservations, it will register also white men on the reservations. On the other hand, Indians who are assimilated into the white population will register with whites of their community. In a few states, governors will handle registration of reservation Indians.

Science News Letter, October 12, 1940

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● RADIO

Fairfield Osborn, of the New York Zoological Society, will describe the strange "Animals in Different Lands," as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Oct. 17, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST.

Listen in on your local station. Listen in each Thursday.

Looking forward toward eventual *colored television,* engineers are experimenting with mechanical and electronic means of commercializing it.

● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association of the following preliminary epicenters.

Friday, Oct. 4, 2:55 a.m., EST

In Northern Chile, region of Iquique. Latitude 20 degrees south. Longitude 69 degrees west.

Saturday, Oct. 5, 10:38.5 EST

Region Pacific Coast of Costa Rica. Latitude 7 degrees north. Longitude, 85 degrees west. Moderate.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see *SNL*, Feb. 24.

Only Science News Letter readers have been invited to join this group. By October 1, more than half the memberships were taken. If you are interested we suggest that you send your application by AIR MAIL!

Now you can look at, try out, feel --and OWN unusual *Things* of science

What will Members get in the first three monthly units of THINGS?

OPTICS UNIT

Two areas of valuable optical film will go to members. With them you can perform experiments that will be easy for you but which have baffled the world's finest minds for more than 250 years. We will describe *four* of these experiments which you can perform without buying any additional equipment. Then we'll explain *how* these films work.

FINGERPRINT UNIT

Fingerprinting is in the news these days. One thinks of impressing an ink-smudged finger on paper—a messy business. Members will receive an *inkless fingerprinting outfit* with material good for many impressions. There will be a purse fingerprint card that may sometime be useful to you in cashing a check, and an official complete fingerprint record document which may be registered with the Government or kept in your safety deposit box. We'll tell you *how to classify* the arches, loops, whorls and composites in yours or any fingerprints.

FABRICS UNIT

Members will receive a piece of *cloth spun from glass;* a tuft of fiber *made from milk* which feels like wool; a silk-like cloth made from *salt, coal, lime and air;* a sheet of paper that feels like cloth; and other new fabrics which are products of scientific experiment.

Coming- THINGS units on Taste, Plastics, Meteorites, Heredity, Odors, Archaeology, to name a few of the units on which the Staff of Science Service is now working.

Message to Schools

The description of each unit of THINGS will be on bristol board, with a museum-style legend for use in a laboratory display cabinet if desired. The legend card will also contain on its lower portion, a clear, brief explanation of the contents of the unit.

FOR YEARS, we of the staff of Science Service, the non-profit institution for the dissemination of scientific knowledge, have been asked questions like these:

How can I get a sample of *this* new substance? or
What does *that* new product feel like? or
My son asked me about this discovery, and I want to make it more real to him—can you send me a *demonstration unit?*

In the past we had no way to meet these requests, but there have been so many of them that we have *now worked out a way.*

A new science group is being organized to receive THINGS of science. The membership of this group is by necessity limited during 1940 to 1,000 and restricted to the United States. To each member of this new group we will each month dispatch *a unit of scientific material,* unusual, intriguing, surprising. With each unit we will supply a brief, clear explanation of its contents.

Since this is a non-profit organization, THINGS will not attempt to make money, so the membership charge has been set at $2. Every member will get the full measure of interest and curiosity-satisfying knowledge from his monthly unit of THINGS.

The membership period will reach from November, 1940 through May, 1941, and will entitle each member to *seven* monthly units of THINGS.

You are invited to become a member. We recommend that you send us the following application form *immediately* because when a total of 1,000 friends of science have joined, the roster will have to be closed.

MAIL THIS APPLICATION

To: *Things*

2101 Constitution Avenue, Washington, D. C.

I hereby apply for membership in your new science group, and enclose $2 for the seven units which are to be dispatched to me monthly, postage prepaid, from November 1940 through May 1941.

Signature _____

Mailing Address _____

City & State _____C

ECOLOGY

NATURE RAMBLINGS
by Frank Thone

Rooted Counsellors

BEFORE you decide whether farming or forestry should be encouraged in a given region, go out and look at what is already growing on it, Prof. Raphael Zon, of the U. S. Forest Service, advised conservationists attending the University of Pennsylvania Bicentennial Conference. The natural vegetation can tell you where you can hope for a profit from corn or potatoes, and where you had better leave the land unplowed and put in the slower but surer tree crops.

Prof. Zon, who is director of the U. S. Lake States Forest Experiment Station at St. Paul, cited several examples from his own region. A growth of sweetfern, bearberry and blueberry indicates low-fertility soil best suited for jack pine or red pine. Presence of maidenhair fern, hepatica and large-flowered trillium is a sign of fairly good soil, which will support hardwoods like sugar maple, yellow birch and basswood. A forest of elm, ash, soft maple and other bottom-land hardwoods tells of heavy loams and clay loams, which when cleared and drained are suitable for agriculture.

Disregard, in past years, of such ecological guideposts as these sent farming in many communities down the road to rapid and irredeemable ruin.

Prof. Zon's findings for the country around the Great Lakes were confirmed by parallel studies on the entirely different conditions in the Southwest, reported by Dr. Gustaf A. Pearson, senior silviculturist of the U. S. Southwestern Forest and Range Experiment Station.

Dr. Pearson divides his terrain into seven distinct vegetational zones, ranging from desert through several types of forest to alpine. Each vegetational zone, he stated, is also a local climatic zone, with its own distinctive ranges of summer and winter temperature, and of rainfall. Only by consulting the natural preferences of any proposed kind of planting, and putting it in the zone where it naturaly belongs, can the farmer or forester be assured of success.

Science News Letter, October 12, 1940

PUBLIC HEALTH

Big Influenza Epidemic Due As 25-Year Cycle Nears End

A BIG epidemic of influenza, such as occurred during the World War, is about due although at present England is free of this and other epidemics usually associated with war.

The report of no epidemics in England at present was brought back by Dr. John E. Gordon, professor of preventive medicine and epidemiology at Harvard Medical School, who left England Sept. 17.

Dr. Gordon would make no predictions as to when, where or whether influenza would strike, but he admitted that we are near the end of the 25-year-cycle which world-wide epidemics of this disease seem to follow.

Crowding and cold temperature in air raid shelters and lowered resistance due to lack of sleep may pave the way for an influenza epidemic to start in England, he said. If an epidemic comes we shall probably be no better able to stop it than we were during the last war, Dr. Gordon said, although influenza is at present one of the most active fields of medical research. Chief centers for this work are the Medical Research Institute in England and the laboratories of the Rockefeller Foundation in New York, where a promising vaccine has recently been developed. This vaccine was tried during an epidemic in Puerto Rico this summer, but no conclusive evidence of its value has yet been reported. If another epidemic breaks out, it is likely to be tried again. The Puerto Rican trials were handicapped, it is believed, by the fact that the peak of the epidemic had passed before the vaccination trials could be started.

Science News Letter, October 12, 1940

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of SCIENCE NEWS LETTER published weekly at Washington, D. C., for Oct. 1, 1940.

Washington
District of Columbia
ss.

Before me, a Notary Public in and for the District of Columbia aforesaid, personally appeared Watson Davis, who, having been duly sworn according to law, deposes and says that he is the Editor of the SCIENCE NEWS LETTER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Editor, Watson Davis, 2101 Constitution Ave., Washington, D. C.

2. That the owner is:

Science Service, Inc., 2101 Constitution Ave., Washington, D. C., a non-profit corporation without stock, operating as the Institution for the Popularization of Science.

3. That the known bondholders, mortgagees, and other security holders owning or holding mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Watson Davis,
Editor

Sworn to and subscribed before me this 25th day of September, 1940.

[SEAL]

Charles L. Wade

(My commission expires March 14, 1943)

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ZOOLOGY

MY LIFE IN A MAN-MADE JUNGLE—Belle J. Benchley—*Little, Brown,* 293 p., $3. The only woman director of a zoological park in the world tells of her dealings with her manifold, sometimes difficult but always interesting family in fur and feathers. She gives us intimate glimpses of the lives of the birds and beasts in her care, which are fascinating when they are in normal health, but doubly so when they are ill, or still babies, and thus in need of "mothering". Numerous good photographs help to bring out the character of the animals.

Science News Letter, October 12, 1940

GENERAL SCIENCE

THE ROCKEFELLER FOUNDATION, Annual Report, 1939—*Rockefeller Foundation, 49 West 49th Street, New York City,* 507 p., illus., Free upon direct request to Rockefeller Foundation. Far-flung and extensive are the works of this great organization promoting research and education. Each annual chronicle is a significant chapter in our intellectual progress.

Science News Letter, October 12, 1940

HORTICULTURE

THE HOME GARDENING ENCYCLOPAEDIA (2d. ed.)—Walter Brett, ed.—*Chemical Pub. Co.,* 448 p., $2.50. A new edition of a much-appreciated British work on horticulture. An astonishing amount of information is packed into its brief articles.

Science News Letter, October 12, 1940

PSYCHOLOGY—POLITICAL SCIENCE

THE RAPE OF THE MASSES, The Psychology of Totalitarian Political Propaganda—Serge Chakotin; trans. by E. W. Dickes—*Alliance Bk. Corp.,* 310 p., $3. See page 232.

Science News Letter, October 12, 1940

BIOLOGY—CHEMISTRY

LABORATORY INSTRUCTIONS IN BIOCHEMISTRY—Israel S. Kleiner and Louis B. Dotti—*Mosby,* 188 p., $1.50. A laboratory workbook on loose leaves, punched for insertion in a ring binder.

Science News Letter, October 12, 1940

BOTANY

EXPERIMENTAL STUDIES ON THE NATURE OF SPECIES, I. Effect of Varied Environments on Western North American Plants—Jens Clausen, David D. Keck and William M. Hiesey—*Carnegie Inst. of Washington,* 452 p., $4.50, cloth; $3.50 paper. The authors present results of an experimental program initiated in 1922 by the late Dr. Harvey Monroe Hall, wherein the effects of environmental differences on the appearance and structure of plant species are investigated. Sometimes these effects are so pronounced that plants from the opposite ends of an ecological series (e.g., seashore to mountain-top) are hardly recognizable as specifically related.

Science News Letter, October 12, 1940

GEOLOGY

ATLANTIC SUBMARINE VALLEYS OF THE UNITED STATES AND THE CONGO SUBMARINE VALLEY—A. C. Veatch and P. A. Smith—*Geological Soc. of Amer.,* 101 p., 10 folded maps, $4. Discovery of submerged canyons of major magnitude has caused a great deal of excited discussion in both geological and popular circles. It is a fine thing to have the facts about two of the principal canyon areas concisely arranged, and (what is even more important) to have the areas mapped completely, to the limits of known data.

Science News Letter, October 12, 1940

EDUCATION

IMMEDIATE EFFECTS OF INTERPOLATED REST PERIODS ON LEARNING PERFORMANCE—John Robert Gentry — *Teachers College Columbia Univ.,* 57 p., $1.60.

Science News Letter, October 12, 1940

GENERAL SCIENCE

CREATIVE SCIENCE, 553 p., $1.80; CREATIVE SCIENCE SERIES, LIFE ACTIVITIES, 260 p., $1.16—Daniel R. Hodgdon and Morris Nelson Sachs—*Hinds, Hayden & Eldredge.* Texts for the ninth and seventh years, full of illustrations, questions, things to do.

Science News Letter, October 12, 1940

GENERAL SCIENCE

WORKBOOK TO UNDERSTANDING SCIENCE, 106 p., tests, 68c.; WORKBOOK TO SCIENCE FOR DAILY USE, 116 p., tests, $1.48; WORKBOOK TO SCIENCE FOR HUMAN CONTROL, 122 p., tests, $1.68—Ralph K. Watkins and Winifred Perry—*Macmillan.*

Science News Letter, October 12, 1940

CHILD STUDY

GROWING OUT OF BABYHOOD, Problems of the Preschool Child—William S. Sadler and Lena K. Sadler—*Funk & Wagnalls,* 350 p., $2.50. This is a book written by psychiatrists for physicians, teachers and parents.

Science News Letter, October 12, 1940

SOCIOLOGY

ADVENTURING FOR DEMOCRACY—Wilbur C. Phillips—*Social Unit Press,* 380 p., $3. A plan for social organization that uses fundamentally the city block or its equivalent as a unit, organizing producers and consumers cooperatively, is explained and advocated through this autobiographical presentation by the founder of the movement. John Dewey, by example, comments: "I know of no idea or plan of greater promise for a right development of our social-economic conditions here in America than the Social Unit Plan." Milk distribution in New York City is suggested as a practical application.

Science News Letter, October 12, 1940

POLITICAL SCIENCE

THE PULSE OF DEMOCRACY—George Gallup and Saul Forbes Rae—*Simon and Schuster,* 335 p., $2.50. Have you wondered who and how many are questioned in the Gallup polls? Have you questioned whether the poll itself might not influence public opinion in a "bandwagon" fashion? Such questions are answered in this timely book.

Science News Letter, October 12, 1940

PSYCHOLOGY

THE PSYCHOLOGY OF ADOLESCENCE (Rev. ed.)—Karl C. Garrison—*Prentice-Hall,* 477 p., $3. To this text from the North Carolina State College has been added new material on youth problems, religious development and achieving independence.

Science News Letter, October 12, 1940

TELEVISION

TELEVISION TO-DAY AND TO-MORROW (5th. ed.)—Sydney A. Moseley and H. J. Barton-Chapple—*Pitman Pub. Co.,* 179 p., $3. In this latest edition of a book that has already demonstrated its popularity, television developments in England up to the beginning of the war are covered. Little is said about American practice.

Science News Letter, October 12, 1940

ENGINEERING

QUIZ ON RAILROADS AND RAILROADING—*Obtainable from Association of American Railroads, Transportation Bldg., Washington, D. C.,* Free. Almost all the questions one can think of concerning American railroads, their history, operation and maintenance are answered in this attractively prepared and illustrated booklet.

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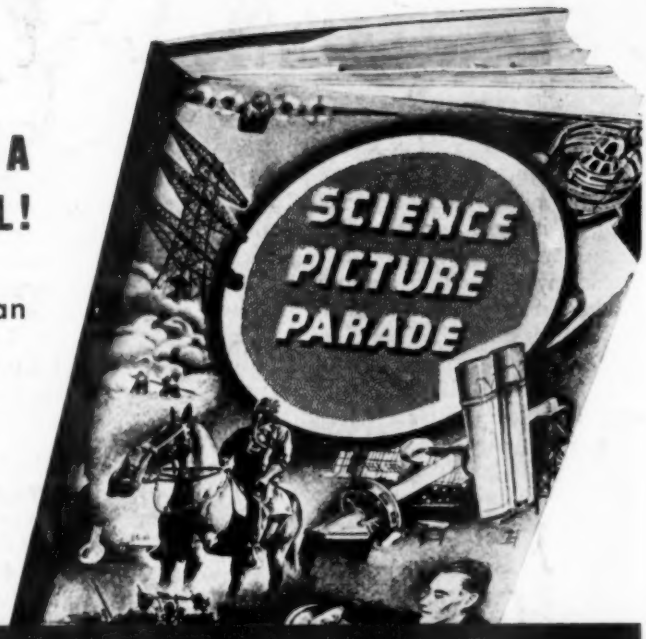

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ANIMALS—panda, koala, tarsier, white bison, aard-vark, two-headed trout, paramecium . . .

ARCHAEOLOGY — Folsom Man, low-browed King Ashurnasir-apal of Assyria, high-hatted Pharaoh Merenptah of Egypt, a Mayan calendar-image from Tuxtla . . .

ATOMS—cyclotrons, split atoms of uranium, cosmic rays . . .

AVIATION—bombers for war, clippers for peace, autogiros, wind tunnels . . .

BIRDS—dodos, tame eagles, left-handed parrots, emperor penguins, apartment size turkeys.

CHEMISTRY—nylon, glass fabrics, acrylic resin, propane, deuterium . . .

EARTH—fertile lava, a canyon from a plow furrow, resources for war, earth's record of age . . .

ELECTRICITY—artificial lightning, giant generators, power for the people, electricity-into-sound, voice of Vader . . .

HEALTH—life-saving sulfanilamide, vitamins and more vitamins, rescue for the "living dead" . . .

INDUSTRY—new processes, new inventions, new uses, arms for defense . . .

INSECTS—cicada in flight, mantis at prayer? Insect Enemy No. 1: Mosquito . . .

LIGHT—cigarette-sized arc lamp, a man loses his shadow, lamps that kill germs, lamps that make meat tender, golf swing taken apart . . .

MIND—"candid" picture of a brain, curious human behavior, "ascent of man" . . .

PLANTS—colchicine's marigolds, X-ray of a lily, soilless gardens . . .

RADIO—FM, cardioid directional mircophone, radio facsimile, coaxial cable, television in the air . . .

STARS—supernovae, sun spots, giant of Palomar . . .

TRANSPORT—streets of tomorrow, ancient center-line, America's propeller, "pendulum" railroad cars, rockets . . .

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WEATHER—drought, flood, snow crystals, lightning, air-mass analysis . . .

FUTURE—power from sun and atom, synthetic diamonds, more chemotherapy, man getting along with man.

THE AUTHOR

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